

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

FURTHER NOTES ON FISHES FROM THE CANAL
ZONE.*

BY BARTON WARREN EVERMANN AND
EDMUND LEE GOLDSBOROUGH.

In these Proceedings for June 25, 1909 (Vol. XXII, pp. 95-104), the present writers reported on a small collection of fishes obtained in the Canal Zone by Mr. August Busck of the U. S. National Museum and Mr. Allan H. Jennings, of the Sanitary Inspection Service, Canal Zone. In that paper were recorded 19 species, one of which (*Cheirodon gorgonæ*) was described as new.

Since the publication of that report we have received from Mr. Jennings another small, but interesting, collection embracing 133 specimens representing 14 species, which are here recorded. In this connection we wish to express our appreciation of the interest which Mr. Jennings has taken in collecting the fishes of the Canal Zone. He is especially interested in the food of the freshwater fishes and its relation to the mosquito problem. Much that we now know regarding the fishes of the Canal Zone and their food, we owe to him.

FAMILY SILURIDÆ.
THE CATFISHES.

Pimelodus chagresi Steindachner.

One specimen 5 inches long. No definite locality given.

FAMILY CHARACINIDÆ.
THE CHARACINS.

Piabucina panamensis Gill.

One specimen $2\frac{1}{4}$ inches long from a sluggish stream emptying into a dammed-up lake at Gatun, August 15. Dorsal 10; anal 10; scales 26.

* Published by permission of Hon. Geo. M. Bowers, Commissioner of Fish and Fisheries.

Mr. Jennings says this species grows to a length of at least 8 inches, and he did not observe it at any other point.

Brycon striatulus (Kner).

Six specimens 3 to $3\frac{1}{4}$ inches.

Astyanax fischeri Steindachner.

One specimen 3 inches long from Comacho River below reservoir dam at Empire, June 18.

Astyanax æneus (Günther).

Two specimens $2\frac{3}{4}$ and $2\frac{7}{8}$ inches long from Comacho River below reservoir dam at Empire, June 18; twelve specimens $\frac{7}{8}$ to $2\frac{3}{4}$ inches long, no definite locality; one $1\frac{1}{8}$ inches long from Tabernilla, taken in January; and two, $1\frac{1}{4}$ and $1\frac{1}{2}$ inches long, from a sluggish stream emptying into a dammed-up lake at Gatun, August 15. The specimen from Tabernilla was kept by Mr. Jennings in an aquarium for more than 3 months. It ate 33 mosquito larvae in one day and 20 the next.

Astyanax mexicanus (Filippi).

Five specimens $1\frac{7}{8}$ to $2\frac{1}{2}$ inches long; no definite data given. These have the dorsal uniformly with 9 rays; anal 13 or 14, + 2 or 3 short simple rays; scales 33 to 35; teeth in maxillary in 2 rows, 2 teeth in outer and 4 in inner row; outside of this outer maxillary row is a single irregular row of teeth in the premaxillary. These specimens agree well with typical *mexicanus*, except in the number of anal rays; *mexicanus* is said to have from 17 to 24 branched rays; none of ours has more than 14.

Roeboides guatemalensis (Günther).

Six specimens $2\frac{3}{4}$ to $3\frac{5}{8}$ inches long; no definite locality given. Dorsal 10; anal 46 to 50; gillrakers 6-10; scales 78-85.

FAMILY POECILIIDÆ.

THE KILLIFISHES.

Rivulus isthmensis Garman.

One specimen 1 inch long from a swampy, freshwater pond by side of railroad at Gatun, July 15. Lives on bottom.

Gambusia nicaraguensis Günther.

Six specimens 1 to $1\frac{7}{8}$ inches long from Cristobal, August 4. Mr. Jennings says these have a spot on side near vent. This spot is now evident in but two of the specimens. It is dusky brown and covers 3 or 4 scales just above vent, it not being on the scale immediately over vent. Three specimens $\frac{3}{4}$ to $1\frac{1}{8}$ inches long from Folks River Swamp at Cristobal, July 8, and four $1\frac{1}{8}$ to $1\frac{3}{8}$ inches long from same place, August 4.

Gambusia episcopi Steindachner.

Fourteen specimens 1 to $1\frac{1}{2}$ inches long; no definite locality given. These all show distinctly the black spot at base of anal which seems to be characteristic of this species. One specimen $1\frac{1}{8}$ inches long from swampy

freshwater pond at side of railroad at Gatun, July 15. Nine female specimens $1\frac{1}{2}$ to $2\frac{1}{8}$ inches long and one male $1\frac{1}{8}$ inches long from reservoir at New Porto Bello, February 10, 1909. Mr. Jennings says this is the most abundant and characteristic species, but not very efficient larvæ destroyers. It appears to be chiefly a bottom feeder.

Pœcilia sphenops Cuvier and Valenciennes.

Eighteen specimens $1\frac{1}{8}$ to 2 inches long from Folks River Swamp, Cristobal, August 4. These show the many variations of this species indicated by Regan in *Biologia Centrali Americana*. One specimen $1\frac{1}{2}$ inches long from reservoir at New Porto Bello, February 10, 1909. Dorsal 9; anal ii, 8; scales 26. Teeth conical or pointed, some of them slightly truncate, and one or two tricuspid. One female specimen $2\frac{3}{4}$ inches long from Aneon. This fish was kept in a tank for 3 months and preserved June 18. Six females and one male, $\frac{3}{4}$ to $1\frac{3}{4}$ inches long; no definite locality given. These each show a distinct black spot at anterior base of dorsal fin, covering 3 or 4 rays. The modified anal fin is evident in all, even in the very small one. In the largest example the anal is entirely in advance of dorsal fin and in the others it is variously so, its origin grading back to directly under origin of dorsal. The origin of the dorsal is uniformly equally distant from tip of snout and middle of caudal fin. Seven specimens $\frac{3}{4}$ to $1\frac{9}{16}$ inches long from Gatun, August 15. These all show 7 or 8 distinct vertical bars on body and 5 of the smaller ones show the black spot at anterior base of dorsal.

FAMILY MUGILIDÆ.

THE MULLET.

Agonostomus monticola (Banerft).

One specimen 3 inches long; no definite locality given. Four specimens each about $2\frac{1}{4}$ inches long from stream below reservoir at foot of dam at New Porto Bello, February 10, 1909. Mr. Jennings says these are found in swift water only and will not live in ordinary confinement. Habits as to larvæ not observed.

FAMILY CICHLIDÆ.

THE CICHLIDS.

Acara cœruleopunctata Kner and Steindachner.

One specimen 2 inches long from Gatun, August 15. Mr. Jennings says this fish came from a sluggish stream emptying into a dammed-up lake at Gatun, and that the species is apparently widely distributed in the Chagres River and tributaries, of which this stream is one.

Geophagus crassilabris Steindachner.

Five specimens $2\frac{5}{8}$ to $3\frac{7}{8}$ inches long from Canal Zone. Dorsal XVI, 10; anal III, 7; scales 30.

Neotroplus nematopus Günther.

Two specimens $2\frac{1}{2}$ and $3\frac{3}{8}$ inches long. These specimens are very badly preserved, the scales being rubbed off of the anterior part of the

smaller one and over much of anterior lower part of the larger example. The smaller one has dorsal XVI, 8; and VI, 7; the larger one has dorsal XVII, 10; anal VI, 7; scales 30. Each shows a white bar at base of caudal rays, none of it on scales, black posterior to this bar; body of fish uniform dark brown.

FAMILY GOBIIDÆ.

THE GOBIES.

Eleotris pisonis (Gmelin).

One specimen $1\frac{3}{4}$ inches long from Beach Island Swamp, Cristobal, August 18. This is brackish water. The feeding habits of the fish were not observed.

Dormitator maculatus (Bloch).

Four specimens $1\frac{1}{2}$ to $3\frac{3}{4}$ inches long from Folk River Swamp. Nine specimens $2\frac{3}{8}$ to $3\frac{3}{8}$ inches long from Ancon. One specimen $2\frac{5}{8}$ inches long from Ancon was kept in a tank 3 months and preserved June 18. Eleven specimens $1\frac{1}{2}$ to 2 inches long from New Porto Bello, February 10, from stream entering reservoir from south. Mr. Jennings says: "Very shy, inhabit bottom, hiding under stones, etc. Habits as to larvæ and adaptability to confinement not observed." One specimen 1 inch long from running ditch of fresh water, with growth of algae at Cristobal, July 1. Mr. Jennings says its food habits are not known. It remains much at the bottom. Two specimens $\frac{7}{8}$ and 1 inch long from Folks River Swamp, Cristobal, August 4; from mangrove swamp, water brackish, swamp not infrequently overflowed, but these fish bore change to fresh water well.